Nisbah Bobot Ampas Teh Hitam dan Ampas Kopi sebagai Adsorben Cu (II) dan Zn (II) Dalam Pengolahan Limbah Cair Batik

(Weight Ratio of Black Tea Waste and Spent Coffee Grounds as Cu (II) and Zn (II) Adsorbent in the Batik Wastewater Treatment)

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ABSTRACT

The objectives of this study were : Firstly, to determine the weight ratio of black tea waste and spent coffee grounds in the batik wastewater purification process. Secondly, to determine the adsorption isotherm models of various weight ratio of black tea waste and spent coffee grounds as adsorbent of the batik wastewater as revealed by the government quality standards (Perda Jateng No. 5 / 2012). Data were analyzed by Randomized Completely Block Design (RCBD), 5 treatments and 5 replications, and as the block is the time analysis. As the treatments were various weight ratio of black tea waste and spent coffee grounds (g / g), which are : 15 : 5 ; 12,5 : 7,5 ; 10 : 10 ; 7,5 : 12,5 ; and 5 : 15, respectively. To test the differences between treatment means, the Honestly Significant of Differences (HSD) were used at 5% level of significant.

The results of the study showed that the weight ratio (12,5 gr : 7,5 gr) of black tea waste and spent coffee grounds can decrease effectively the following parameters : 84,90% COD, 91,98% copper (Cu) and 62,68% zinc (Zn) in period of 600 minutes contact time with stirring. The adsorption isotherm model for COD is Freundlich Isotherm with the maximum capacity of adsorption is 59,88 mg/g, while the adsorption isotherm model of Cu and Zn are Langmuir Isotherm with the maximum capacity of adsorption is 43,67 mg/g (Cu) and 41,67 mg/g (Zn).

Keywords : Isotherm Adsorption, Spent Coffee Grounds, Black Tea waste, Batik Wastewater